

Exploring SACOG's GitHub and Open-Source Scripting Repository

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Agenda

- Why SACOG uses GitHub
- Highlighted repositories
 - Regional Monitoring
 - SACSIM23

Why SACOG Uses GitHub

- Efficiency
- Version control
- Transparency
- Methodology sharing

Projects

REGIONAL MONITORING

Progress Report and Dashboard

[2021 Regional Progress Report | SACOG](#)

2021 Regional Progress Report

How the Greater Sacramento region is tracking on key measures of economic prosperity, vibrant places, and connected communities

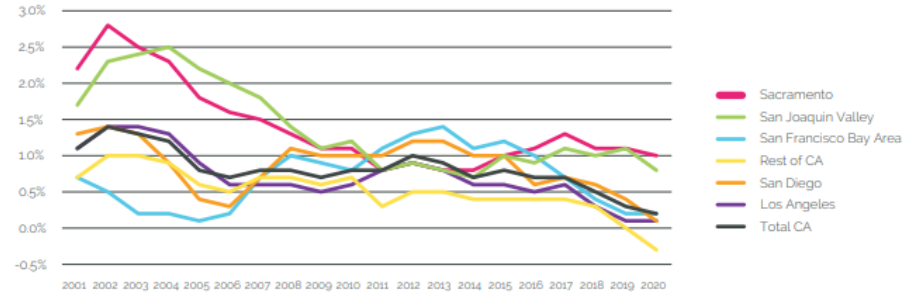


As coastal growth slows, Sacramento region becomes fastest growing in California

State-wide growth has shrunk significantly over the last several years: at 0.2% annually, population growth in the state has never been lower.

The Sacramento region's steady population growth the last five years places the region as the fastest growing in the state, as population growth has shifted inland: Sacramento and the San Joaquin Valley have reclaimed their status as the fastest-growing California regions, not only on a percentage but on an absolute basis.

Who We Are Figure 2. Annual Population Growth, Sacramento Region and Other California Regions, 2000 to 2020



Source: SACOG, December 2020. Based on DOF/DRU E-5 series.

Regional-Monitoring

- Organized by data source
- Code and configuration folders
- Data pipelines in Python to programmatically automate data collection, data cleaning, aggregations, ... whenever new data is available
- Code structure for data sources with an API (Application Programming Interface)
 1. Importing
 2. Processing
 3. Data Visualization
 4. Exporting to dashboard

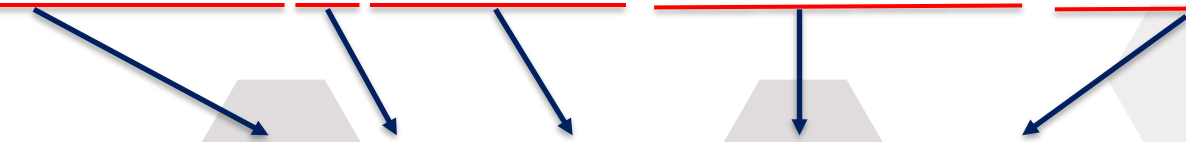
*Code in steps 2-4 are specific to how SACOG wants to organize indicators

Example with an API

- Census Bureau

- American Community Survey (ACS), Public Use Microdata Sample (PUMS), ...
- [Census Data API: /data](#)
- Example API request query (URL):

https://api.census.gov/data/2022/acs/acs5?get=NAME,B08301_003E&for=county:067&in=state:06&key=YOUR_KEY_GOES_HERE



```
query = f"{root_}{g_}{variables_}{location_}{api_key_}"  
response = requests.get(query).text
```

Example with an API

Type	Input
indicator_name	Commute_1
estimate	ACS5
sample	ACS
geography	MSA
import_tab	MSA
margin_of_error	Yes
year_start	2009
year_end	2022

states	counties
CA	El Dorado
CA	Placer
CA	Sacramento
CA	Sutter
CA	Yolo
CA	Yuba

Table	ID	Label	Table Name	Indicator Nam	Includ
B08301	B08301_001E	Estimate!!Total:	Means of Transportation to Work	Commute_1	No
B08301	B08301_002E	Estimate!!Total:!!Car, truck, or van:	Means of Transportation to Work	Commute_1	No
B08301	B08301_003E	Estimate!!Total:!!Car, truck, or van:!!Drove alone	Means of Transportation to Work	Commute_1	Yes
B08301	B08301_004E	Estimate!!Total:!!Car, truck, or van:!!Carpooled:	Means of Transportation to Work	Commute_1	Yes
B08301	B08301_005E	Estimate!!Total:!!Car, truck, or van:!!Carpooled:!!In 2-person carpool	Means of Transportation to Work	Commute_1	No
B08301	B08301_006E	Estimate!!Total:!!Car, truck, or van:!!Carpooled:!!In 3-person carpool	Means of Transportation to Work	Commute_1	No
B08301	B08301_007E	Estimate!!Total:!!Car, truck, or van:!!Carpooled:!!In 4-person carpool	Means of Transportation to Work	Commute_1	No
B08301	B08301_008E	Estimate!!Total:!!Car, truck, or van:!!Carpooled:!!In 5- or 6-person carpool	Means of Transportation to Work	Commute_1	No
B08301	B08301_009E	Estimate!!Total:!!Car, truck, or van:!!Carpooled:!!In 7-or-more-person carpool	Means of Transportation to Work	Commute_1	No
B08301	B08301_010E	Estimate!!Total:!!Public transportation (excluding taxicab):	Means of Transportation to Work	Commute_1	Yes
B08301	B08301_011E	Estimate!!Total:!!Public transportation (excluding taxicab):!!Bus	Means of Transportation to Work	Commute_1	No
B08301	B08301_012E	Estimate!!Total:!!Public transportation (excluding taxicab):!!Subway or elevated rail	Means of Transportation to Work	Commute_1	No
B08301	B08301_013E	Estimate!!Total:!!Public transportation (excluding taxicab):!!Long-distance train or commuter rail	Means of Transportation to Work	Commute_1	No
B08301	B08301_014E	Estimate!!Total:!!Public transportation (excluding taxicab):!!Light rail, streetcar or trolley (carro pùbli	Means of Transportation to Work	Commute_1	No
B08301	B08301_015E	Estimate!!Total:!!Public transportation (excluding taxicab):!!Ferryboat	Means of Transportation to Work	Commute_1	No
B08301	B08301_016E	Estimate!!Total:!!Taxicab	Means of Transportation to Work	Commute_1	Yes
B08301	B08301_017E	Estimate!!Total:!!Motorcycle	Means of Transportation to Work	Commute_1	Yes
B08301	B08301_018E	Estimate!!Total:!!Bicycle	Means of Transportation to Work	Commute_1	Yes
B08301	B08301_019E	Estimate!!Total:!!Walked	Means of Transportation to Work	Commute_1	Yes
B08301	B08301_020E	Estimate!!Total:!!Other means	Means of Transportation to Work	Commute_1	Yes
B08301	B08301_021E	Estimate!!Total:!!Worked from home	Means of Transportation to Work	Commute_1	Yes



Projects

SACSIM23

QuickAgg

Geoprocessing

GenerateToplineSummary

Parameters Environments

Model Run Folder

Roadway VMT (Daynet) DBF

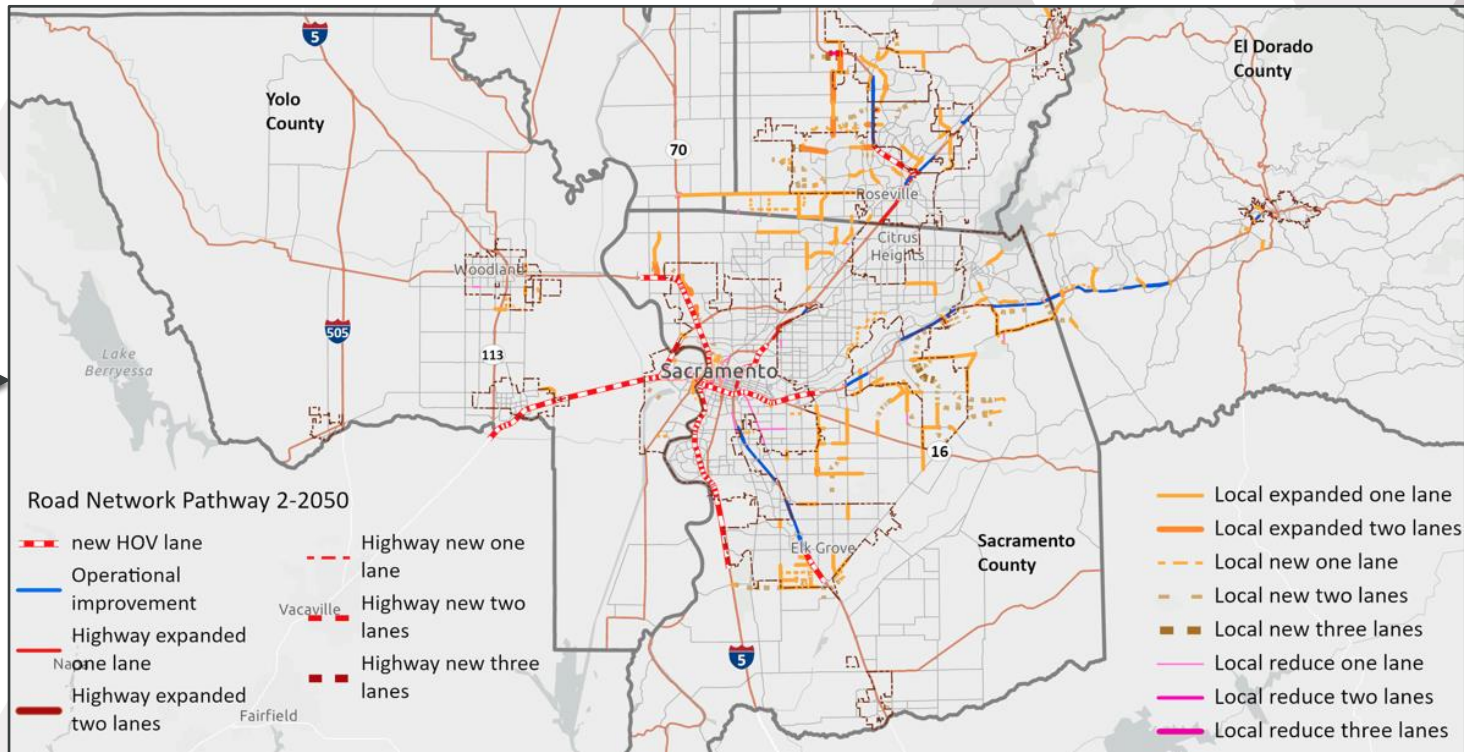
* Scenario Description

tot_pop	2,880,040
tot_hh_pop	2,880,040
tot_vmt_ii	42,050,479
tot_restrips	10,479,017
tot_resvmt_percap	14.6
TRN_REVENUHRS	8,844
DAYVMT_tot	71,887,298
DAYVMT_gtwy	2,677,161
DAYVMT_nongtwy	69,210,137
DAYCVMT_tot	4,436,880
DAYCVMT_gtwy	261,326
DAYCVMT_nongtwy	4,175,553
lanemi_motveh	12,171
walk_trips	971,253
bike_trips	224,340
sov_trips	4,605,341
hov2_trips	2,306,391
hov3_trips	2,154,305
transit_trips	161,395
schoolbus_trips	27,643
tnc_trips	28,349

Base-Future Network Comparison

Base
.NET file

Future
.NET file

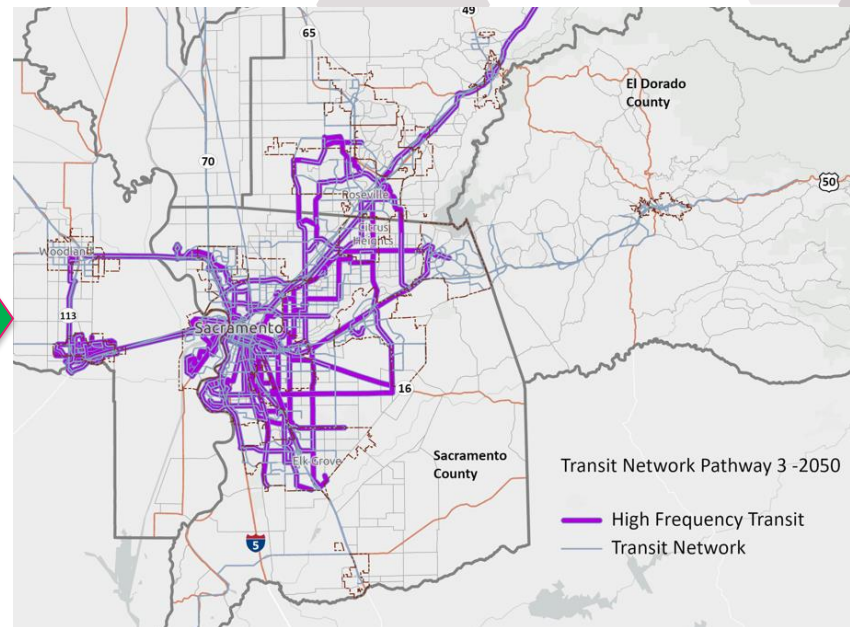


Transit LIN – GIS converter

Transit LIN file...

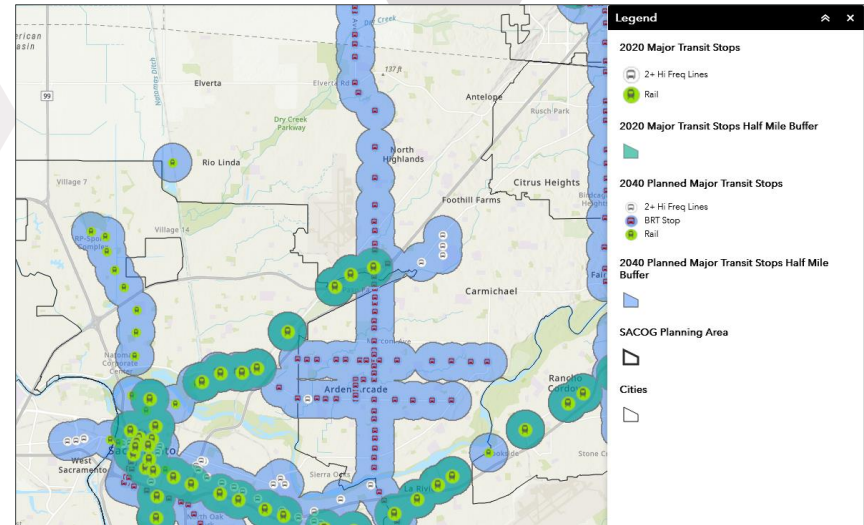
```
;;<<PT>><<LINE>>;  
; Q:\SACSIM23\Network\Cube\SACSIM23GISNets.gdb\PT2020_wTranLinks  
LINE NAME="AMTRCC_A", MODE=2, OPERATOR=10, ONEWAY=T, HEADWAY[3]=180,  
HEADWAY[4]=120, FARESYSTEM=14, TIMEFAC[1]=1, TIMEFAC[2]=1,  
TIMEFAC[3]=1, TIMEFAC[4]=1, TIMEFAC[5]=1, COLOR=6, N=8575,  
-8577, 8573, -16164, -16165, -8571, -8569, 8565, 8563, 8561  
LINE NAME="AMTRCC_B", MODE=2, OPERATOR=10, ONEWAY=T, HEADWAY[1]=120,  
FARESYSTEM=14, TIMEFAC[1]=1, TIMEFAC[2]=1, TIMEFAC[3]=1,  
TIMEFAC[4]=1, TIMEFAC[5]=1, COLOR=6, N=8561, 8563, 8565, -8569,  
-8571, -16165, -16164, 8573, -8577, 8575  
LINE NAME="AMTRCCB_A", MODE=2, OPERATOR=10, ONEWAY=T,  
HEADWAY[1]=120, HEADWAY[2]=180, HEADWAY[3]=180, HEADWAY[4]=24,  
HEADWAY[5]=180, FARESYSTEM=14, TIMEFAC[1]=2.01,  
TIMEFAC[2]=2.01, TIMEFAC[3]=2.01, TIMEFAC[4]=2.01,  
TIMEFAC[5]=2.01, COLOR=3, N=3446, -16019, TF=1.18, N=-5862,  
TF=1.18, N=-5244, TF=1.18, N=-5070, TF=1.18, N=-14353, TF=1.18,  
N=-5224, TF=1.18, N=-15974, TF=1.18, N=-5076, TF=1.18, N=-5074,  
TF=1.18, N=-5080, TF=1.18, N=-14356, TF=1.18, N=-5064, TF=1.18,  
N=-5084, TF=1.18, N=-11737, TF=1.18, N=-7258, TF=1.18, N=-9809,  
TF=1.18, N=-9825, TF=1.18, N=-11840, TF=1.18, N=-5474, TF=1.18,  
N=-5615, TF=1.18, N=-9596, TF=1.18, N=-9594, TF=1.18, N=-10034,  
TF=1.18, N=-9598, TF=1.18, N=-9600, TF=1.18, N=-14392, TF=1.18,  
N=-9602, TF=1.18, N=-14390, TF=1.18, N=-9604, TF=1.18, N=-9606,  
TF=1.18, N=-9254, TF=1.18, N=-14388, TF=1.18, N=-14386,
```

...to GIS file



Major transit stop identifier

- Various laws incentivize building housing near “major” transit stops
- Script helps map out “major” transit stops based on SACSIM transit attributes and legal definition



SACSIM Run Catalog Tool

- What it can do:
 - Compare model runs' inputs and log which inputs differ
 - Archive *unique* versions of different model inputs
 - Reconstruct model scenarios from archived inputs if rerun needed

Catalog tool – archiving example

- Example:
 - You have 10 model runs.
 - Each run needs a parcel file
 - But 9/10 runs use identical parcel file, i.e., only 2 unique parcel files
 - For archiving, you only store the 2 unique files, rather than keeping 10 copies in 10 different runs
 - Based on time stamp and year, you can reconstruct a run if needed.

	2016_base---Tue May 14 2024 22-41-11 .net	5/14/2024 3:41 PM
	2016_ixxi---Sat May 27 2023 00-13-00 .dbf	5/26/2023 5:13 PM
	2016_PNR---Sat May 27 2023 00-13-00 .dbf	5/26/2023 5:13 PM
	2016_raw_household---Sat May 27 2023 00-13-00 .txt	5/26/2023 5:13 PM
	2016_raw_household---Thu Sep 05 2024 00-05-43 .txt	9/4/2024 5:05 PM
	2016_raw_parcel---Sat May 27 2023 00-13-00 .txt	5/26/2023 5:13 PM
	2016_raw_parcel---Thu Sep 05 2024 02-40-49 .txt	9/4/2024 7:40 PM
	2016_raw_person---Sat May 27 2023 00-13-00 .txt	5/26/2023 5:13 PM
	2016_raw_person---Thu Sep 05 2024 00-06-53 .txt	9/4/2024 5:06 PM
	2016_station_links---Sat May 27 2023 00-14-00 .csv	5/26/2023 5:14 PM
	2016_taz---Sat May 27 2023 00-14-00 .dbf	5/26/2023 5:14 PM
	2016_thru---Sat May 27 2023 00-14-00 .dbf	5/26/2023 5:14 PM
	2016_tranline---Tue May 14 2024 22-23-16 .lin	5/14/2024 3:23 PM

Python wrapper for Voyager Scripts

- Leverages python subprocess module to call and run Voyager scripts from within python scripts.
- Streamlines multi-step workflows into single step.
- Example use cases
 - Transit LIN-to-GIS converter
 - Major transit stop identifier script
 - Any time you want to integrate Voyager processes into a larger python process

GitHub Links

- [Regional monitoring tools](#)
- [SACSIM23](#)
 - [QuickAgg](#)
 - [Base-Future Network Comparison](#)
 - [Transit LIN – GIS converter](#)
 - [Major transit stop identifier](#)
 - [SACSIM Run Catalog Tool](#)
 - [Python wrapper for Voyager scripts](#)